AMENDMENTS TO THE CLAIMS

This listing of Claims will replace all prior versions and listings of Claims in this application.

Listing of Claims

1. (Currently amended) A method for making a holder/optical-element assembly, comprising the steps of:

positioning a cylindrical holder material in a press-molding die, the cylindrical holder material having an outer circumferential surface and an inner circumferential surface, wherein the inner circumferential surface has a void part;

positioning an optical-element material inside the cylindrical holder material;

heating the cylindrical holder material and the optical-element material to their own softening temperature; and

press-molding the cylindrical holder material and the optical-element material to form a cylindrical holder and an optical element, respectively, thereby fixing the optical element to the inner circumferential surface, allowing a projected portion of the optical element formed by pressure created during press-molding to extend radially outward from an outer edge, the projected portion being contained by the void part and between the inner circumferential surface and the outer circumferential surface,

wherein the cylindrical holder material comprises a cavity in the inner circumferential surface for retaining the projected portion of the optical element,

wherein the optical-element material includes a volume of material for forming a lens and an extra volume for compensating for a volume error, the extra volume being less than a volume of the void part of the cylindrical holder ~~wherein an extra amount of the optical-element material is added, in advance, to the volume required for forming the optical element, and the spatial volume of the void part is larger than the volume of the extra amount of the optical-element material~~, and

wherein the cylindrical holder is formed in an integrated form, and the void part of the cylindrical holder is formed so as to extend out in a radial direction of the cylindrical holder from the inner circumferential surface of the cylindrical holder.

2. (Previously presented) A method for making a holder/optical-element assembly according to Claim 1, wherein the pressure created during press-molding allows a part of the optical-element material to flow into the void part of the cylindrical holder to form the projected portion of the optical element.

3. (Previously presented) A method for making a holder/optical-element assembly according to Claim 1 further comprising forming reference surfaces in an outer surface of the cylindrical holder by press-molding the cylindrical holder material for mounting the holder/optical-element assembly along an optical axis and in a radial direction.

4. (Previously presented) A method for making a holder/optical-element assembly according to Claim 1, wherein pressure created during press-molding allows the extra amount to flow into the void part of the cylindrical holder to form the projected portion of the optical element.

5. (Canceled)

6. (Original) A method for making a holder/optical-element assembly according to Claim 1, wherein the holder material comprises a plurality of micro-pores in the void part for retaining the projected portion of the optical element.

7. (Previously presented) A method for making a holder/optical-element assembly according to Claim 1, wherein the holder material has a plurality of the micro- pores on a part of the inner circumferential surface, the micro-pores included in the void part for retaining the projected portion of the optical element.

8. (Previously Presented) A method for making a holder/optical-element assembly according to Claim 1, wherein the cavity comprises one or more concentric cavities in the inner circumferential surface.

9. (Original) A method for making a holder/optical-element assembly according to Claim 6, wherein the projected portion comprises a hemispherical section of the optical-element material.

10. (Canceled)

11. (Previously presented) A method for making a holder/optical-element assembly according to Claim 1, wherein the outer circumferential surface comprises a metal selected from the group consisting of aluminum and stainless steel.

12. (Original) A method for making a holder/optical-element assembly according to Claim 1, wherein the holder material is characterized by a flow resistance and the optical-element material is characterized by a viscosity, and wherein the flow resistance of the holder material varies inversely to the viscosity of the optical-element material.

13. (Previously presented) A method for making a holder/optical-element assembly according to Claim 4, wherein the holder material is characterized by a flow resistance and the void part is characterized by a volume, and wherein the volume of the void part and the flow resistance of the holder material are adjusted to accommodate the extra amount of optical-element material in the void part.

14. (Original) A method for making a holder/optical-element assembly according to Claim 8, wherein the holder material is characterized by a flow resistance and the one or more concentric cavities are characterized by a width, and wherein the flow resistance of the holder material varies in proportion to the width of the one or more concentric cavities.

15. (Original) A method for making a holder/optical-element assembly according to Claim 1, wherein the softening temperature of the cylindrical holder material is higher than the softening temperature of the optical element material.

16. (Original) A method of Claim 15, wherein heating the cylindrical holder material and the optical-element material comprises heating to a temperature about 30 degrees lower than the softening temperature of the cylindrical holder material.

17. (Original) The method of Claim 15, wherein the softening temperature of the cylindrical holder material is about 30 degrees higher than the softening temperature of the optical-element material.

18. (Previously presented) The method of Claim 1, further comprising:

wherein providing the cylindrical holder material comprises providing a material having a specified flow resistance,

wherein providing the optical-element material comprises providing a material having a viscosity, a glass transition temperature, and a glass softening temperature,

selecting a heating temperature between the glass transition temperature and the glass softening temperature; and

adjusting the flow resistance of the void part and a mold pressure during press-molding to accommodate the projected portion.

19. (Original) The method of Claim 1, wherein heating the cylindrical holder material and the optical-element material comprises heating to a temperature between the glass transition and the glass softening temperature of the optical-element material.

20. (Previously presented) A method for making a holder/optical-element assembly, comprising the steps of:

positioning a cylindrical holder material in a press-molding die, the cylindrical holder material having an outer circumferential surface and an inner circumferential surface, wherein the inner circumferential surface has a void part;

positioning an optical-element material inside the cylindrical holder material;

heating the cylindrical holder material and the optical-element material to their own softening temperature; and

press-molding the cylindrical holder material and the optical-element material to form a cylindrical holder and an optical element, respectively, thereby fixing the optical

element to the inner circumferential surface, allowing a projected portion of the optical element formed by pressure created during press-molding to extend radially outward from an outer edge, the projected portion being contained by the void part and between the inner circumferential surface and the outer circumferential surface,

wherein the press-molding step and the void part are adjusted ~~such that when an extra amount of the optical-element material is added, in advance, to the volume required for forming the optical element, the extra amount flows into the void part of the cylindrical holder to form the projected portion of the optical element, but in the absence of such extra amount, substantially no optical-element material flows into the void part of the cylindrical holder~~ so that an extra volume of optical-element material for compensating for a volume error flows into the void part, but does not completely fill the void part, and

wherein the cylindrical holder is formed in an integrated form, and the void part of the cylindrical holder is formed so as to extend out in a radial direction of the cylindrical holder from the inner circumferential surface of the cylindrical holder.

21. (Previously presented) The method for making a holder/optical-element assembly of claim 1, wherein the press-molding die includes an internal upper die and an internal lower die for forming upper and lower surfaces of the optical element, an external upper die and an external lower die for forming upper and lower surfaces of the cylindrical holder, provided on an outer circumferential side of the internal upper die and the internal lower die, respectively, and an outer circumferential die for forming the outer circumferential surface of the cylindrical holder, provided on an outer circumferential side of the external upper die, the external lower die, and the cylindrical holder.

22. (Previously presented) The method for making a holder/optical-element assembly of claim 20, wherein the press-molding die includes an internal upper die and an internal lower die for forming upper and lower surfaces of the optical element, an external upper die and an external lower die for forming upper and lower surfaces of the cylindrical holder, provided on an outer circumferential side of the internal upper die and the internal lower die, respectively, and an outer circumferential die for forming the outer

circumferential surface of the cylindrical holder, provided on an outer circumferential side of the external upper die, the external lower die, and the cylindrical holder.